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EXAMINER	
WANG, BEN C	
ART UNIT	**PAPER NUMBER**
2192	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/26/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/721,242	DIETRICH ET AL.	
	Examiner	Art Unit	
	Ben C. Wang	2196	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11/26/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-38 are pending in this application and presented for examination.

Claim Rejections – 35 USC § 103(a)

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 4-5, 7-9, 11-15, 17-19, 21, 23, 25, 27, 29-32, and 34-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roetzheim et al. (hereafter 'Roetzheim') (Pub. No. 2003/0018952 A1) in view of Podgurski et al. (hereafter 'Podgurski') (*Estimation of Software Reliability by Stratified Sampling, 1999, ACM*).

4. **As to claim 1**, Roetzheim discloses a method of estimating a cost (Fig 1. element 38; Fig. 7, elements 151 – cost, and 183) related to at least one of computer software development ([0001], lines 3-5), computer software maintenance (Fig. 7, element 175), and information technology services ([0050], lines 1-8).

Roetzheim further discloses that an adaptable resource estimating system operates on a computer system and uses a highly flexible parametric rule (Abstract, lines 1-2). But, Roetzheim does not specifically disclose method comprising of reading a

sample of computer code in accordance with a sampling technique; and calculating a cost for a larger subset of the computer code from sampling; calculating a cost for a larger subset of the computer code from sampling, wherein at least one of reading, sampling, and calculating is executed on a computer.

However, in an analogous art, Podgurski discloses method comprising of reading a sample of computer code in accordance with a sampling technique (Table 1, Parse1 through Parse5; Sec. 5.1, lines 7-14; Sec. 2, lines 1-14); calculating a cost for a larger subset of the computer code from sampling (Sec. 4, steps 6, 7 – sampling → estimating; Sec. 7, step 4), wherein at least one of reading (Sec. 5.1, line 1; Table I), sampling, and calculating is executed on a computer (Sec. 5.2, 3rd Para., lines 1-2).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine the teachings of Roetzheim and the teachings of Podgurski to further provide a sampling method of estimating a cost related to computer software development, computer software maintenance, and information technology services in Roetzheim system.

The motivation is that stratified sampling approach is computationally feasible, can isolate failures, and can significantly reduce the cost of estimating software reliability ([Podgurski], Sec. 9, lines 5-8).

5. **As to claim 9**, Roetzheim discloses a method of estimating necessary amounts of resources (Fig 1. element 38; Fig. 7, elements 151 – cost, and 183) for an effort related to at least one of computer software development ([0001], lines 3-5), computer

software maintenance (Fig. 7, element 175), and information technology services ([0050], lines 1-8).

Roetzheim further discloses that an adaptable resource estimating system operates on a computer system and uses a highly flexible parametric rule (Abstract, lines 1-2). But, Roetzheim does not specifically disclose method comprising of reading a sample of computer code in accordance with a sampling technique; and calculating resources for a larger subset of the computer code from sampling; calculating resources for a larger subset of the computer code from sampling, wherein at least one of reading, sampling, wherein at least one of reading, sampling, and calculating is executed on a computer.

However, in an analogous art, Podgurski discloses method comprising of reading a sample of computer code in accordance with a sampling technique (Table 1, Parse1 through Parse5; Sec. 5.1, lines 7-14; Sec. 2, lines 1-14); calculating resources for a larger subset of the computer code from sampling (Sec. 4, steps 6, 7 – sampling → estimating; Sec. 7, step 4), wherein at least one of reading (Sec. 5.1, line 1; Table I), sampling, and calculating is executed on a computer (Sec. 5.2, 3rd Para., lines 1-2).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine the teachings of Roetzheim and the teachings of Podgurski to further provide a sampling method of estimating necessary amounts of resources for related to computer software development, computer software maintenance, and information technology services in Roetzheim system.

The motivation is that stratified sampling approach is computationally feasible, can isolate failures, and can significantly reduce the cost of estimating software reliability ([Podgurski], Sec. 9, lines 5-8).

Furthermore, Roetzheim and Podgurski do not specifically disclose calculating resources for a larger subset of the computer code from sampling, wherein at least one of reading, sampling.

6. **As to claim 19**, Roetzheim discloses a business method comprising at least one of: estimating a cost (Fig 1. element 38; Fig. 7, elements 151 – cost, and 183) for an effort related to at least one of computer software development ([0001], lines 3-5), and information technology (IT) services ([0050], lines 1-8); and further providing a result of calculating to a party ([0005], lines 8-11); and receiving result of calculating (Fig. 7, elements 177, 179, 181 and 183; Fig.8, the tab of Results – most of upper central portion).

Roetzheim further discloses that an adaptable resource estimating system operates on a computer system and uses a highly flexible parametric rule (Abstract, lines 1-2). But, Roetzheim does not specifically disclose estimating method comprising: sampling computer code in accordance with a sampling technique; calculating cost for a larger subset of the computer code from computer code from sampling and calculating cost for a larger subset of the computer code from computer code from sampling; and calculating at least one of a risk probability and an estimation precision for cost, wherein at least one of reading, sampling, and calculating is executed on a computer.

However, in an analogous art, Podgurski discloses estimating method comprising: sampling computer code in accordance with a sampling technique (Table 1, Parse1 through Parse5; Sec. 5.1, lines 7-14; Sec. 2, lines 1-14); calculating cost for a larger subset of the computer code from computer code from sampling (Sec. 4, steps 6, 7 – sampling → estimating; Sec. 7, step 4) and calculating at least one of a risk probability and an estimation precision for cost (Sec. 2, 1st Para., lines 7-9; Sec. 8, 3rd Para.), wherein at least one of reading (Sec. 5.1, line 1; Table I), sampling, and calculating is executed on a computer (Sec. 5.2, 3rd Para., lines 1-2).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine the teachings of Roetzheim and the teachings of Podgurski to further provide a sampling method of estimating a cost for an effort related to computer software development, computer software maintenance, and information technology services in Roetzheim system.

The motivation is that stratified sampling approach is computationally feasible, can isolate failures, and can significantly reduce the cost of estimating software reliability ([Podgurski], Sec. 9, lines 5-8).

7. **As to claim 21**, Roetzheim discloses a business method comprising at least one of: estimating a necessary amount of resources (Fig 1. element 38; Fig. 7, elements 151 – cost, and 183) for an effort related to at least one of computer software development ([0001], lines 3-5), and information technology (IT) services ([0050], lines 1-8) and further providing a result of calculating to a party ([0005], lines 8-11); and receiving

result of calculating (Fig. 7, elements 177, 179, 181 and 183; Fig.8, the tab of Results – most of upper central portion).

Roetzheim further discloses that an adaptable resource estimating system operates on a computer system and uses a highly flexible parametric rule (Abstract, lines 1-2). But, Roetzheim does not specifically disclose estimating method comprising: sampling computer code in accordance with a sampling technique; calculating necessary amount of resources for a larger subset of the computer code from computer code from sampling; calculating necessary amount of resources for a larger subset of the computer code from computer code from sampling and calculating at least one of a risk probability and an estimation precision for estimate of amount of resources, wherein at least one of reading, sampling, and calculating is executed on a computer.

However, in an analogous art, Podgurski discloses estimating method comprising: sampling computer code in accordance with a sampling technique (Table 1, Parse1 through Parse5; Sec. 5.1, lines 7-14; Sec. 2, lines 1-14); calculating necessary amount of resources for a larger subset of the computer code from computer code from sampling (Sec. 4, steps 6, 7 – sampling → estimating; Sec. 7, step 4) and calculating at least one of a risk probability and an estimation precision for estimate of amount of resources (Sec. 2, 1st Para., lines 7-9; Sec. 8, 3rd Para.), wherein at least one of reading (Sec. 5.1, line 1; Table I), sampling, and calculating is executed on a computer (Sec. 5.2, 3rd Para., lines 1-2).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine the teachings of Roetzheim and the teachings

of Podgurski to further provide a business method of estimating a necessary amount of resources for an effort related to computer software development, computer software maintenance, and information technology services in Roetzheim system.

The motivation is that stratified sampling approach is computationally feasible, can isolate failures, and can significantly reduce the cost of estimating software reliability ([Podgurski], Sec. 9, lines 5-8).

8. **As to claim 23**, Roetzheim discloses an apparatus to estimate at least one of a cost and an amount of necessary resources for an effort (Fig 1. element 38; Fig. 7, elements 151 – cost, and 183) related to computer software development ([0001], lines 3-5), computer software maintenance (Fig. 7, element 175), and information technology services ([0050], lines 1-8), apparatus comprising: a memory to store a computer code involved in an effort related to software development ([0012]); a graphic user interface to allow computer code to be selected (Figs. 8-19).

Roetzheim further discloses that an adaptable resource estimating system operates on a computer system and uses a highly flexible parametric rule (Abstract, lines 1-2). But, Roetzheim does not specifically disclose apparatus comprising a sampling module to allow computer code to be sampled in accordance with a sampling technique.

However, in an analogous art, Podgurski discloses apparatus comprising a sampling module (Sec. 5.1, lines 7- 17; step (1) through step (7)) to allow computer

code to be sampled in accordance with a sampling technique (Table 1, Parse1 through Parse5; Sec. 5.1, lines 7-14; Sec. 2, lines 1-14).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine the teachings of Roetzheim and the teachings of Podgurski to further provide an apparatus to estimate a cost and an amount of necessary resources for an effort related to computer software development, computer software maintenance, and information technology services in Roetzheim system.

The motivation is that stratified sampling approach is computationally feasible, can isolate failures, and can significantly reduce the cost of estimating software reliability ([Podgurski], Sec. 9, lines 5-8).

9. **As to claim 25**, Roetzheim discloses a signal-bearing medium tangibly embodying a program of machine-readable instructions executable by a digital processing apparatus to perform a method of estimating at least one of a cost and a necessary amount of resources (Fig 1. element 38; Fig. 7, elements 151 – cost, and 183) for an effort related to computer software development ([0001], lines 3-5), computer software maintenance (Fig. 7, element 175), and information technology services ([0050], lines 1-8).

Roetzheim further discloses that an adaptable resource estimating system operates on a computer system and uses a highly flexible parametric rule (Abstract, lines 1-2). But, Roetzheim does not specifically disclose method comprising: reading a section of computer code; sampling computer code in accordance with a sampling

technique; and using sampling to calculating at least one of cost and amount of resources for a larger subset of the computer code from computer code from sampling, and using sampling to calculating at least one of cost and amount of resources for a larger subset of the computer code from computer code from sampling, wherein sampling, and calculating is executed on a computer.

However, in an analogous art, Podgurski discloses method comprising: reading a section of computer code; sampling computer code in accordance with a sampling technique (Table 1, Parse1 through Parse5; Sec. 5.1, lines 7-14; Sec. 2, lines 1-14); and using sampling to calculating at least one of cost and amount of resources for a larger subset of the computer code from computer code from sampling (Sec. 4, steps 6, 7 – sampling → estimating; Sec. 7, step 4), wherein sampling, and calculating is executed on a computer (Sec. 5.2, 3rd Para., lines 1-2).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine the teachings of Roetzheim and the teachings of Podgurski to further provide a signal-bearing medium tangibly embodying a program of machine-readable instructions executable by a digital processing apparatus to perform a method of estimating a cost of estimating a cost and a necessary amount of resources for an effort related to computer software development, computer software maintenance, and information technology services in Roetzheim system.

The motivation is that stratified sampling approach is computationally feasible, can isolate failures, and can significantly reduce the cost of estimating software reliability ([Podgurski], Sec. 9, lines 5-8).

10. **As to claim 27**, Roetzheim discloses an apparatus to estimate a cost (Fig 1. element 38; Fig. 7, elements 151 – cost, and 183) for an effort related to computer software development ([0001], lines 3-5), computer software maintenance (Fig. 7, element 175), and information technology services ([0050], lines 1-8), apparatus comprising: means for storing a computer code involved in an effort related to software development ([0012]); means for allowing computer code to be selected (Figs. 8-19).

Roetzheim further discloses that an adaptable resource estimating system operates on a computer system and uses a highly flexible parametric rule (Abstract, lines 1-2). But, Roetzheim does not specifically disclose means for allowing computer code to be sampled in accordance with a sampling technique (Table 1, Parse1 through Parse5; Sec. 5.1, lines 7-14; Sec. 2, lines 1-14).

However, in an analogous art, Podgurski discloses means for allowing computer code to be sampled in accordance with a sampling technique (Sec. 5.1, lines 7- 17; step (1) through step (7)).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine the teachings of Roetzheim and the teachings of Podgurski to further provide means for allowing computer code to be sampled in accordance with a sampling technique in Roetzheim system.

The motivation is that stratified sampling approach is computationally feasible, can isolate failures, and can significantly reduce the cost of estimating software reliability ([Podgurski], Sec. 9, lines 5-8).

11. **As to claim 32**, Roetzheim discloses an apparatus to estimate an amount of necessary resources for an effort related to computer software development ([0001], lines 3-5), computer software maintenance (Fig. 7, element 175), and information technology services ([0050], lines 1-8), apparatus comprising: means for storing a computer code involved in an effort related to software development ([0001], lines 3-5); means for allowing computer code to be selected (Figs. 8-19).

Roetzheim further discloses that an adaptable resource estimating system operates on a computer system and uses a highly flexible parametric rule (Abstract, lines 1-2). But, Roetzheim does not specifically disclose means for allowing computer code to be sampled in accordance with a sampling technique.

However, in an analogous art, Podgurski discloses means for allowing computer code to be sampled in accordance with a sampling technique (Sec. 5.1, lines 7- 17; step (1) through step (7)).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine the teachings of Roetzheim and the teachings of Podgurski to further provide means for allowing computer code to be sampled with a sampling technique in Roetzheim system.

The motivation is that stratified sampling approach is computationally feasible, can isolate failures, and can significantly reduce the cost of estimating software reliability ([Podgurski], Sec. 9, lines 5-8).

12. **As to claim 4**, Roetzheim does not disclose the method further comprising: categorizing each computer sampling into one of N categories of difficulty, N being an integer greater than 1.

However, in an analogous art, Podgurski discloses the method further comprising: categorizing each computer sampling into one of N categories of difficulty, N being an integer greater than 1 (Sec. 1, 3rd Para., lines 5-8; Sec. 3, 2nd Para., lines 6-8; Sec. 5.2, 2nd Para., lines 18-21).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine the teachings of Roetzheim and the teachings of Podgurski to further provide a method further comprising of categorizing each computer sampling in Roetzheim system.

The motivation is that clustering sampling based on dissimilarity of branch traversal profiles can isolate certain failures in sampling programs ([Podgurski], Sec. 5.5).

13. **As to claim 5**, Roetzheim discloses the method further comprising: cost parameters (Fig. 7, element 151, cost parameter; [0082]) to be used for calculating.

But, Roetzheim does not specifically disclose the method further comprising: reading into a computer at least one of a rule by which sampling is to be executed.

However, in an analogous art, Podgurski discloses the method further comprising: reading into a computer at least one of a rule by which sampling is to be

executed (Sec. 2, 1st Para., lines 1-3; Roetzheim does disclose rule selection framework (Fig. 7, element 151; [0013], lines 1-5)).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine the teachings of Roetzheim and the teachings of Podgurski to further provide a method comprising of reading into a computer at least one of a rule by which sampling is to be executed in Roetzheim system.

The motivation is that stratified sampling approach is computationally feasible, can isolate failures, and can significantly reduce the cost of estimating software reliability ([Podgurski], Sec. 9, lines 5-8).

14. **As to claims 7 and 17**, Roetzheim does not disclose the method wherein sample is taken using at least one of: simple random sampling; cluster sampling; and stratified sampling.

However, in an analogous art, Podgurski discloses the method wherein sample is taken using at least one of: simple random sampling (Sec. 5, lines 1-4; Sec. 5.2, 1st Para., lines 3-6); cluster sampling (Sec. 3, 2nd Para., lines 1-3; Sec. 4, item (5)); and stratified sampling (Sec. 2, lines 1-3, lines 12-14).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine the teachings of Roetzheim and the teachings of Podgurski to further provide the method wherein sample is taken using at least one of: simple random sampling; cluster sampling; and stratified sampling in Roetzheim system.

The motivation is that stratified sampling approach is computationally feasible, can isolate failures, and can significantly reduce the cost of estimating software reliability ([Podgurski], Sec. 9, lines 5-8).

15. **As to claims 8 and 18**, Roetzheim does not disclose the method wherein the sample includes at least one of: a line of code; a file or module from an application or set of applications; an initial part of a file or a module from an application or set of applications; and an application from a set of applications.

However, in an analogous art, Podgurski discloses the method wherein the sample includes at least one of: a line of code; a file or module from an application or set of applications; an initial part of a file or a module from an application or set of applications; and an application from a set of applications (Sec. 5.1, lines 22-27; Sec. 5.2, 1st Para., formulas of $V(P)$, formulas of $V(P_{st})$; Sec. 5.4, 1st Para., lines 1-3; Table II).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine the teachings of Roetzheim and the teachings of Podgurski to further provide a sampling based on various levels of sampling in Roetzheim system.

The motivation is to improve the accuracy of estimating the cost of software reliability ([Podgurski], Sec. 5.4).

16. **As to claim 11**, Roetzheim does not disclose the method further comprising at least one of calculating one or more variabilities of amounts of resources due to

sampling error; and calculating a probability that amount of resources will be less than the amounts of resources that would have been estimated by using a sample including 100% of the code.

However, in an analogous art, Podgurski discloses the method further comprising at least one of calculating one or more variabilities of amounts of resources due to sampling error (Sec. 2, 1st Para., lines 1-7, 2nd Para., lines 6-10); and calculating a probability that amount of resources will be less than the amounts of resources that would have been estimated by using a sample including 100% of the code (Sec. 2, 1st Para., lines 7-9; Sec. 8, 3rd Para., lines 1-4, Sec. 4, step (1) through step (7); Fig. 1; Table II; Sec. 5.3, lines 6-10; Sec. 5.4, lines 1-2).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine the teachings of Roetzheim and the teachings of Podgurski to further provide the method further comprising at least one of calculating one or more variabilities of amounts of resources due to sampling error; and calculating a probability that amount of resources will be less than the amounts of resources that would have been estimated by using a sample in Roetzheim system.

The motivation is that stratified sampling approach is computationally feasible, can isolate failures, and can significantly reduce the cost of estimating software reliability ([Podgurski], Sec. 9, lines 5-8).

17. **As to claim 12**, Roetzheim does not disclose the method further comprising: categorizing each computer sampling into one of N categories of difficulty, N being an integer greater than 1.

However, in an analogous art, Podgurski discloses the method further comprising: categorizing each computer sampling into one of N categories of difficulty, N being an integer greater than 1 (Sec. 1, 3rd Para., lines 5-8; Sec. 3, 2nd Para., lines 6-8; Sec. 5.2, 2nd Para., lines 18-21).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine the teachings of Roetzheim and the teachings of Podgurski to provide a method further comprising of categorizing each computer sampling in Roetzheim system.

The motivation is that clustering sampling based on dissimilarity of branch traversal profiles can isolate certain failures in sampling programs ([Podgurski], Sec. 5.5).

18. **As to claim 13**, Roetzheim discloses the method further comprising resource parameters to be used for calculating ([0012], lines 1-4; Fig. 1; [0035], lines 1-6).

But, Roetzheim does not specifically disclose the method further comprising: reading into a computer at least one of a rule by which sampling is to be executed.

However, in an analogous art, Podgurski discloses the method further comprising: reading into a computer at least one of a rule by which sampling is to be

executed (Sec. 2, 1st Para., lines 1-3; Roetzheim does disclose rule selection framework (Fig. 7, element 151; [0013], lines 1-5)).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine the teachings of Roetzheim and the teachings of Podgurski to further provide a method comprising of reading into a computer at least one of a rule by which sampling is to be executed in Roetzheim system.

The motivation is that stratified sampling approach is computationally feasible, can isolate failures, and can significantly reduce the cost of estimating software reliability ([Podgurski], Sec. 9, lines 5-8).

19. **As to claim 14**, Roetzheim discloses the method further comprising: creating at least one of a resource plan (Fig. 7, element 152; [0089], lines 1-5) and a work breakdown structure based on the calculated resources (Fig. 7, element 169; [0089], lines 11-13).

20. **As to claim 15**, Roetzheim discloses the method further comprising: creating a risk management plan based on calculated risk parameters (Fig. 7, element 171; [0089], lines 13-15).

21. **As to claim 29**, Roetzheim does not specifically disclose the apparatus according further comprising: means for calculating cost for a larger subset of the computer code from computer code from sampling.

However, in an analogous art, Podgurski discloses the apparatus according further comprising: means for calculating cost for a larger subset of the computer code from computer code from sampling (Sec. 4, step (1) through step (7); Fig. 1; Table II; Sec. 5.3, lines 6-10; Sec. 5.4, lines 1-2).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine the teachings of Roetzheim and the teachings of Podgurski to further provide the apparatus comprising of means for calculating cost for a larger subset of the computer code from computer code from sampling in Roetzheim system.

The motivation is that stratified sampling approach is computationally feasible, can isolate failures, and can significantly reduce the cost of estimating software reliability ([Podgurski], Sec. 9, lines 5-8).

22. **As to claim 30**, Roetzheim does not specifically disclose the apparatus further comprising: means for calculating at least one of a risk probability and an estimation precision for cost.

However, in an analogous art, Podgurski discloses the apparatus further comprising: means for calculating at least one of a risk probability and an estimation precision for cost (Sec. 2, 1st Para., lines 7-9; Sec. 8, 3rd Para.).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine the teachings of Roetzheim and the teachings of Podgurski to further provide the apparatus further comprising of means for calculating

at least one of a risk probability and an estimation precision for cost in Roetzheim system.

The motivation is that stratified sampling approach is computationally feasible, can isolate failures, and can significantly reduce the cost of estimating software reliability ([Podgurski], Sec. 9, lines 5-8).

23. **As to claim 31**, Roetzheim does not disclose the apparatus further comprising: means for categorizing each computer sampling into one of N categories of difficulty, N being an integer greater than 1.

However, in an analogous art, Podgurski discloses the apparatus further comprising: means for categorizing each computer sampling into one of N categories of difficulty, N being an integer greater than 1 (Sec. 1, 3rd Para., lines 5-8; Sec. 3, 2nd Para., lines 6-8; Sec. 5.2, 2nd Para., lines 18-21).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine the teachings of Roetzheim and the teachings of Podgurski to further provide the apparatus further comprising means for categorizing each computer sampling into categories of difficulty in Roetzheim system.

The motivation is that clustering sampling based on dissimilarity of branch traversal profiles can isolate certain failures in sampling programs ([Podgurski], Sec. 5.5).

24. **As to claim 34**, Roetzheim does not specifically disclose the apparatus according further comprising: means for calculating amount of necessary resources for a larger subset of the computer code from computer code from sampling.

However, in an analogous art, Podgurski discloses the apparatus according further comprising: means for calculating amount of necessary resources for a larger subset of the computer code from computer code from sampling (Sec. 4, step (1) through step (7); Fig. 1; Table II; Sec. 5.3, lines 6-10; Sec. 5.4, lines 1-2).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine the teachings of Roetzheim and the teachings of Podgurski to further provide the apparatus comprising means for calculating amount of necessary resources for a larger subset of the computer code from computer code from sampling in Roetzheim system.

The motivation is that stratified sampling approach is computationally feasible, can isolate failures, and can significantly reduce the cost of estimating software reliability ([Podgurski], Sec. 9, lines 5-8).

25. **As to claim 35**, Roetzheim does not specifically disclose the apparatus further comprising: means for calculating at least one of a risk probability and an estimation precision for amount of necessary resources.

However, in an analogous art, Podgurski discloses the apparatus further comprising: means for calculating at least one of a risk probability and an estimation

precision for amount of necessary resources (Sec. 2, 1st Para., lines 7-9; Sec. 8, 3rd Para.).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine the teachings of Roetzheim and the teachings of Podgurski to further provide the apparatus comprising means for calculating at least one of a risk probability and an estimation precision for amount of necessary resources in Roetzheim system.

The motivation is that stratified sampling approach is computationally feasible, can isolate failures, and can significantly reduce the cost of estimating software reliability ([Podgurski], Sec. 9, lines 5-8).

26. **As to claim 36**, Roetzheim does not disclose the apparatus further comprising: means for categorizing each computer sampling into one of N categories of difficulty, N being an integer greater than 1.

However, in an analogous art, Podgurski discloses the apparatus further comprising: means for categorizing each computer sampling into one of N categories of difficulty, N being an integer greater than 1 (Sec. 1, 3rd Para., lines 5-8; Sec. 3, 2nd Para., lines 6-8; Sec. 5.2, 2nd Para., lines 18-21).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine the teachings of Roetzheim and the teachings of Podgurski to further provide the apparatus comprising means for categorizing each computer sampling into categories of difficulty in Roetzheim system.

The motivation is that clustering sampling based on dissimilarity of branch traversal profiles can isolate certain failures in sampling programs ([Podgurski], Sec. 5.5).

27. **As to claim 37**, Roetzheim discloses a method for deploying computing infrastructure, comprising integrating computer-readable code into a computing system, wherein the code in combination with the computing system is capable of performing the method of claim 1 (Fig. 1; Fig. 7; [0013], lines 1-5, lines 14-21).

Roetzheim does not specifically disclose computer-readable code of sampling technique.

However, in an analogous art, Podgurski discloses computer-readable code of sampling technique (Sec. 5.1, lines 7- 17; step (1) through step (7)).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine the teachings of Roetzheim and the teachings of Podgurski to further provide computer-readable code of sampling technique in Roetzheim system.

The motivation is that clustering sampling based on dissimilarity of branch traversal profiles can isolate certain failures in sampling programs ([Podgurski], Sec. 5.5).

28. **As to claim 38**, Roetzheim discloses a method for deploying computing infrastructure, comprising integrating computer-readable code into a computing system,

wherein the code in combination with the computing system is capable of performing the method of claim 9 (Fig. 1; Fig. 7; [0013], lines 1-5, 14-21).

Roetzheim does not specifically disclose computer-readable code of sampling technique.

However, in an analogous art, Podgurski discloses computer-readable code of sampling technique (Sec. 5.1, lines 7- 17; step (1) through step (7)).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine the teachings of Roetzheim and the teachings of Podgurski to further provide computer-readable code of sampling technique in Roetzheim system.

The motivation is that clustering sampling based on dissimilarity of branch traversal profiles can isolate certain failures in sampling programs ([Podgurski], Sec. 5.5).

29. Claims 2-3, 6, 10, 16, 20, 22, 24, 26, 28, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roetzheim in view of Podgurski, and further in view of Briand et al. (hereafter 'Briand') (*An Assessment and Comparison of Common Software Cost Estimation Modeling Techniques, 1999, ACM*).

30. **As to claim 2**, Roetzheim discloses the method wherein cost is for at least one of: maintenance of software (Fig. 7, element 175); application portfolio management of

software (Fig. 7, element 152; [0089], lines 1-7); and legacy transformation of software ([0096], lines 4-8).

But, Roetzheim and Podgurski do not specifically disclose the method wherein cost is for at least one of: porting software to another platform.

However, in an analogous art, Briand discloses the method wherein cost is for at least one of: porting software to another platform (Table 1, Variable of HAR – Target Platform; Fig. 1; Fig. 2; Sec. 4, Descriptive Statistics, lines 11-17).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine the teachings of Roetzheim and the teachings of Podgurski with the teachings of Briand to further enhance the method for estimating cost of porting software to another platform in Roetzheim-Podgurski system.

The motivation is to further accurately calculate its cost estimation associated with software porting ([Briand], Sec. 4, Selected Model Variables).

31. **As to claim 3**, Roetzheim does not specifically disclose the method further comprising at least one of: calculating a variability of cost due to sampling error; and calculating a probability that cost will be lower than the cost that would have been estimated by using a sample including 100% of the code.

However, in an analogous art, Podgurski discloses the method further comprising calculating a probability that cost will be lower than the cost that would have been estimated by using a sample including 100% of the code (Sec. 2, 1st Para., lines 7-9; Sec. 8, 3rd Para., lines 1-4).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine the teachings of Roetzheim and the teachings of Podgurski to further provide the method further comprising at least one of: calculating a variability of cost due to sampling error; and calculating a probability that cost will be lower than the cost that would have been estimated by using a sample in Roetzheim system.

The motivation is that stratified sampling approach is computationally feasible, can isolate failures, and can significantly reduce the cost of estimating software reliability ([Podgurski], Sec. 9, lines 5-8).

Furthermore, Podgurski and Podgurski do not disclose the method further comprising at least of calculating a variability of cost due to sampling error (Sec. 3, Evaluation Criteria, 1st Para.).

However, in an analogous art, Briand discloses the method further comprising at least of calculating a variability of cost due to sampling error.

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine the teachings of Roetzheim and the teachings of Podgurski with the teaching of Briand to further provide the method comprising of calculating a variability of cost due to sampling error in Roetzheim-Podgurski system.

The motivation is to further accurately calculate its cost estimation based on evaluation criteria ([Briand], Sec. 3, Evaluation Criteria).

32. **As to claims 6 and 16**, Roetzheim and Podgurski do not disclose the method wherein categorizing comprises at least one of: a user-assisted technique in which a user enters a category for each sampled computer code lines; and an automated technique in which a software tool parses each sampled computer code line and generates a category for each parsed computer code line.

However, in an analogous art, Briand discloses the method wherein categorizing comprises at least one of: a user-assisted technique in which a user enters a category for each sampled computer code lines; and an automated technique in which a software tool parses each sampled computer code line and generates a category for each parsed computer code line (Sec. 3, Modeling Techniques, Automatable).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine the teachings of Roetzheim and the teachings of Podgurski with the teaching of Briand to further provide the method wherein categorizing comprises a user-assisted and an automated technique for each sampled computer code line and generates a category for each parsed computer code line in Roetzheim-Podgurski system.

The motivation is to have a technique substantially automated to reduce computationally intensive modeling ([Briand], Sec. 3, Modeling Techniques).

33. **As to claim 10**, Roetzheim discloses the method wherein resources are for at least one of; maintenance of software (Fig. 7, element 175); application portfolio

management of software (Fig. 7, element 152; [0089], lines 1-7); and legacy transformation of software ([0096], lines 4-8).

But, Roetzheim and Podgurski do not specifically disclose the method wherein resources are for at least one of: porting software to another platform.

However, in an analogous art, Briand discloses the method wherein resources are for at least one of: porting software to another platform (Table 1, Variable of HAR – Target Platform; Fig. 1; Fig. 2; Sec. 4, Descriptive Statistics, lines 11-17).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine the teachings of Roetzheim and the teachings of Podgurski with the teachings of Briand to further enhance the method for estimating resources of porting software to another platform in Roetzheim-Podgurski system.

The motivation is to further accurately calculate its resources estimation associated with software porting ([Briand], Sec. 4, Selected Model Variables).

34. **As to claims 20 and 22**, Roetzheim discloses the business method wherein effort comprises at least one of: maintenance of software (Fig. 7, element 175); application portfolio management of software (Fig. 7, element 152; [0089], lines 1-7); and legacy transformation of software ([0096], lines 4-8).

But, Roetzheim and Podgurski do not specifically disclose the business method wherein effort comprises at least one porting software to another platform.

However, in an analogous art, Briand discloses the business method wherein effort comprises at least one porting software to another platform (Table 1, Variable of HAR – Target Platform; Fig. 1; Fig. 2; Sec. 4, Descriptive Statistics, lines 11-17).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine the teachings of Roetzheim and the teachings of Podgurski with the teachings of Briand to further enhance the method for estimating cost of porting software to another platform in Roetzheim-Podgurski system.

The motivation is to further accurately calculate its cost estimation associated with software porting ([Briand], Sec. 4, Selected Model Variables).

35. **As to claims 24, 28, and 33**, Roetzheim disclose the apparatus wherein effort comprises one of maintaining computer code (Fig. 7, element 175); performing application portfolio management on computer code (Fig. 7, element 152; [0089], lines 1-7); and performing legacy transformation on code ([0096], lines 4-8).

But, Roetzheim and Podgurski do not specifically disclose the apparatus wherein effort comprises one of porting computer code to another platform.
However, in an analogous art, Briand discloses the apparatus wherein effort comprises one of porting computer code to another platform (Table 1, Variable of HAR – Target Platform; Fig. 1; Fig. 2; Sec. 4, Descriptive Statistics, lines 11-17).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine the teachings of Roetzheim and the teachings

of Podgurski with the teachings of Briand to further enhance the method for estimating resources of porting software to another platform in Roetzheim-Podgurski system.

The motivation is to further accurately calculate its resources estimation associated with software porting ([Briand], Sec. 4, Selected Model Variables).

36. **As to claim 26**, Roetzheim discloses the signal bearing medium wherein effort comprises one of: maintaining computer code (Fig. 7, element 175); performing application portfolio management on computer code (Fig. 7, element 152; [0089], lines 1-7); and performing legacy transformation on code ([0096], lines 4-8).

But, Roetzheim and Podgurski do not specifically disclose the signal bearing medium wherein effort comprises of porting computer code to another platform.

However, in an analogous art, Briand discloses the signal bearing medium wherein effort comprises of porting computer code to another platform (Table 1, Variable of HAR – Target Platform; Fig. 1; Fig. 2; Sec. 4, Descriptive Statistics, lines 11-17).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine the teachings of Roetzheim and the teachings of Podgurski with the teachings of Briand to further enhance the method for estimating resources of porting software to another platform in Roetzheim-Podgurski system.

The motivation is to further accurately calculate its resources estimation associated with software porting ([Briand], Sec. 4, Selected Model Variables).

Conclusion

37. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- DuMouchel et al., Applications of Sampling and Fractional Factoring Designs to Model-Free Data Squashing, Aug, 24, 2003, ACM.

38. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ben C. Wang whose telephone number is 571-270-1240. The examiner can normally be reached on Monday - Friday, 8:00 a.m. - 5:00 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nabil El-Hady can be reached on 571-272-2333. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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